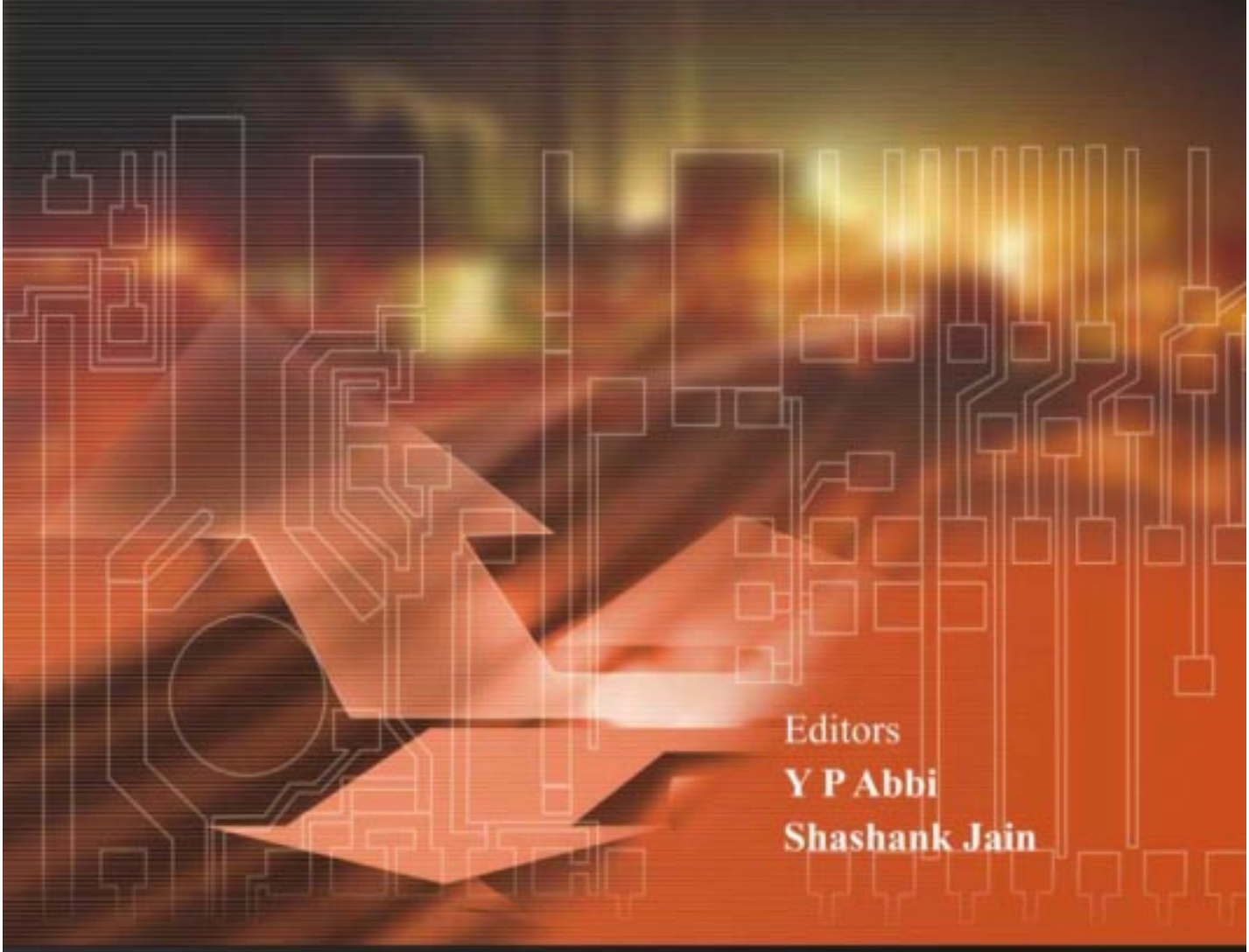
HANDBOOK ON ENERGY AUDIT AND ENVIRONMENT MANAGEMENT



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The Energy and Resources Institute

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Foreword

With oil prices having increased substantially in recent months, the efficient use of energy becomes an even more important objective in economic activities than what was the case earlier. As generally happens, an increase in the price of oil is also accompanied by corresponding increase in the prices of other forms of energy, such as natural gas and coal, which in some cases could be substituted for oil, particularly over a period of time. Overall, the increase in fuel prices is also leading to upward pressure on the prices of electricity not only in India but in other parts of the world as well. All of this provides a strong economic rationale for managing the production and use of energy in a manner that ensures higher levels of efficiency.

In India, two factors have worked against efficient energy use in the past. First, the protection of Indian industry either through import barriers, the permit, and licensing '*raj*', or through the reservations of certain products for small-scale industries, creating a breeding ground for inefficiency in use of all inputs for production, including energy. Second, the prices of energy were not dictated by economic factors, which is likely to change in the future, even in the largely state-dominated power sector. The institution of independent regulation in this sector will create pressures for improving the efficiency of electricity use through more transparent and rational pricing regimes.

Against this background, industry finds it imperative to carry out energy audits and manage the consumption of energy such that costs are reduced and profits maximized. However, a large number of industrial units do not have in-house capabilities and capacities to implement measures for improving energy efficiency. This handbook is being produced as updated and revised edition. As in the case of the first edition, it is hoped that industrial managers would find this a vital tool in implementing energy-efficient measures through energy audits and demand-side management. The handbook

contains valuable material presented in a user-friendly form to ensure that practitioners can gain from it effectively in their energy management efforts.

R K Pachauri
Director-General, TERI

Preface

The world over, energy resources are getting scarcer and the energy costs are consistently going up. The share of energy costs in total production costs in most of the industries is rather significant. Reduction in energy costs can, therefore, improve profit levels in all the industries. This reduction can be achieved by improving the efficiency of industrial equipment and operations.

Energy audits play an important role in identifying energy conservation opportunities in the industrial sector. While they do not provide a final answer to the problem, they do help in identifying the existing potential for energy conservation, and inducing the companies to direct their efforts in this area in a focused manner.

TERI has been actively working in close association with the Indian industry for developing solutions for the challenges posed by the growing demand for energy. It has numerous energy audits to its credit, which have received acclaim for their scope of work and the quality of output. The methodology to carry out these energy audits has been developed over the years, and has been well accepted by the industrial sector.

TERI feels that its experience of more than two decades in the field of conducting energy audits (in more than 400 industrial organizations in India) and from a large number of training programmes organized for the industries must be recorded to provide methodology and guidelines to those involved in this field. An attempt has, therefore, been made to publish this analytical, insightful, and exhaustive *Handbook on energy audit and environment management*. The handbook would enable users to understand the operation of various equipment and systems, and to identify opportunities for energy saving in industrial units. The handbook starts with an overview on industrial energy conservation work in India, and giving a brief on financial analysis for energy conservation projects. It then covers the major energy-consuming equipment.

The first edition of the handbook was published in 2000 and reprinted thrice till 2003. Since first edition, TERI has gained a lot more experience. In this revised and updated edition, 10 more chapters have been added, which cover industrial equipment, solar energy applications, and future cleaner energy options. Controlling the pollution of local environment as well as checking the emissions of GHGs (greenhouse gases), which contribute to global warming and climate change, have gained more importance than ever before in view of the national and international laws as well as corporate social responsibility of the industry. Thus, two chapters on these subjects have also been included. The chapter on climate change also covers the CDM (clean development mechanism) project activities through which the industry in developing countries can benefit financially by adopting cleaner technologies and the energy conservation measures, and also by selling the CERs (certified emission reductions) to developed countries.

This handbook is a 'must read' for every professional interested in energy management and auditing as well as environment management. TERI also believes that this reference guide would help in building capacity among industry personnel, energy auditors, consultants, and the financial institutions active in this area.

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